



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,274	03/29/2004	Sean T. Crowley	AMKOR-022CB1	2255
7663	7590	06/06/2005	EXAMINER	
STETINA BRUNDA GARRED & BRUCKER			LE, THAO X	
75 ENTERPRISE, SUITE 250				
ALISO VIEJO, CA 92656			ART UNIT	PAPER NUMBER

2814

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

2

<b>Office Action Summary</b>	Application No. 10/812,274	Applicant(s) CROWLEY ET AL.	
	Examiner Thao X. Le	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/21/04, 06/24/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 13, 16-20 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6757178 to Okabe et al.

Regarding claim 13, Okabe discloses a substrate for integration into a semiconductor package in fig. 3, the substrate comprising: a non-conductive film 21-23, column 4 line 55, defining opposed top and bottom surfaces and including a plurality of vias 30, 31a-b, 32a-b, 33a-c, column 4 line 64, disposed therein; a plurality of upper leads 15a-c, column 5 line 32, disposed on the top film surface adjacent respective ones of the vias; a plurality of lower leads 16a-c, column 4 line 52, disposed on the bottom film surface adjacent respective ones of the vias, each of the lower leads 16a-c being electrically connected to a respective one of the upper leads 15a-c; and at least one transmission line element 51, column 5 line 33, disposed on the top film surface and electrically connected to at least one of the upper leads, fig. 3.

Regarding claims 16-17, Okabe discloses the substrate of claim 13 comprising a plurality of pads (each connection point would have a pad), fig. 3, disposed on the top film surface and electrically connected to respective ones of the upper leads, the pads being arranged in at least one set which is configured to accommodate a passive device 51, fig. 3, wherein the pads are arranged in multiple sets, each of the sets being configured to accommodate a passive device 51, 50, fig. 3.

Regarding claim 18, Okabe discloses the substrate of claim 13 wherein the vias are segregated into an outer set 32a, which extends along and in relative close proximity to a peripheral edge of the non-conductive sheet 22/21/23, and an inner set 30 which is disposed within the outer set 32a, fig. 3.

Regarding claims 19-20, Okabe discloses the substrate of claim 13 wherein each of the vias is lined or filled with a conductive metal material 16c/15c to facilitate the electrical connection of the upper leads to respective ones of the lower leads, fig. 3.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

Art Unit: 2814

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-2, 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6757178 to Okabe et al. in view of US 6867492 to Auburger et al.

Regarding claim 1, Okabe discloses a semiconductor package in fig. 1A comprising: a non-conductive film 21/22/23, column 4 lines, 55, 62 and 64, defining opposed top and bottom film surfaces and including a plurality of vias 30, column 5 line 36, disposed therein; a plurality of upper leads 15c/50, column 4 line 65, column 5 line 42, disposed on the top film surface adjacent respective ones of the vias; a plurality of lower leads 16c, column 5 line 38, disposed on the bottom film surface adjacent respective ones of the vias, each of the lower leads 16c being electrically connected to a respective one of the upper leads 15c; at least one transmission line element 51, column 5 line 33, disposed on the top film surface and electrically connected to at least one of the upper leads 15c, fig. 1 or 2B, at least one semiconductor die 40, column 5 line 1, attached to the top film surface and electrically connected to at least one of the upper leads 15c and the transmission line element 51, fig. 1.

But, Okabe does not disclose a semiconductor package comprising a package body at least partially covering the semiconductor die, the upper leads, the transmission line element, and the top film surface.

However, Auburger discloses a semiconductor package in fig. 4 comprising a package body 35, column 9 line 66, at least partially covering the semiconductor die 1, column 7 line 67, the upper leads 7, column 8 line 45, the transmission line element 25/26 or 32, column 9 lines 28, 47 and column 10 line 65. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the package body teaching of Auburger with Okabe's device because it would have provided the protection the semiconductor package as taught by Auburger, column 14 line 48-52.

Regarding claim 2, Okabe discloses the semiconductor package of claim 1 comprising a plurality of transmission line elements 50/51, fig. 2A, on the top film surface, the semiconductor die 40 being electrically connected to at least one of the transmission line elements, fig. 2A.

Regarding claims 7-8, Okabe discloses the semiconductor package of claim 1 further comprising a plurality of pads (each connection point would have a pad), fig. 1, disposed on the top film surface and electrically connected to respective ones of the upper leads, the pads being arranged in at least one set which is configured to accommodate a passive device, fig. 2A, wherein the pads are arranged in multiple sets, each of the sets being configured to accommodate a passive device, fig. 1.

Regarding claim 9, Okabe discloses the semiconductor package of claim 1 wherein the vias are segregated into an outer set 32a/b which extends along and in relative close proximity to a peripheral edge of the non-conductive sheet 22/21/23, and an inner set 30 which is disposed within the outer set.

Regarding claim 10, Okabe discloses the semiconductor package of claim 1 wherein the non-conductive sheet 21-23 is fabricated from a polyimide film, column 5 line 63.

Regarding claims 11-12, Okabe discloses the semiconductor package of claim 1 wherein each of the vias is lined or filled with a conductive metal material 16c/15c to facilitate the electrical connection of the upper leads to respective ones of the lower leads, fig. 2A.

6. Claims 3, 5-6, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6757178 to Okabe and US 6867492 to Auburger et al. as applied to claim 1 above, and further in view of US Pub2002/0140081 to Chou et al.

Regarding claims 3, 5, and 14 Okabe discloses the semiconductor package of claim 2 wherein the transmission line elements are selected from the group consisting of: an inductor, and wherein the semiconductor die 40 is electrically connected to the upper lead 50 and to the transmission line element by respective ones of a plurality of bond wires 41b, column 5 line 34.

But Okabe does not disclose the semiconductor package wherein the transmission line elements are selected from the group consisting of a shortwave coupler; a balun; a filter; and combinations thereof, and wherein the bond wires are covered by the package body.

However, Chou discloses the semiconductor package wherein the transmission line elements (passive elements) are selected from the group consisting of a shortwave coupler; a balun; a filter; and combinations thereof

[0008], fig. 1. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the passive elements teaching of Chou with Okabe and Auburger's device, because those passive devices would have been typical structure in the modern communication system as taught by Chou [0008].

Regarding claim 6, Okabe discloses the semiconductor package of Claim 5 wherein at least some of the upper leads 15a/15c or 50 each include a conductive trace connected thereto and extending therefrom, the bond wires 41a/41b being used to electrically connect the semiconductor die 40 to at least one of the traces, fig. 1 or 2A-B.

7. Claims 4, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6757178 to Okabe and US 6867492 to Auburger et al. as applied to claim 1 above, and further in view of US Pub 2003/0020502 to Sugihara et al.

Regarding claims 4, 15 Okabe discloses the semiconductor package the lower lead 16c and upper lead 15c and the transmission line 50 element each include a copper and gold, column 6 line 1-4.

But Okabe does not disclose the semiconductor package wherein the lower lead and upper lead and the transmission line element each include a nickel/gold.

However, Sugihara discloses a conductive line on the polyimide substrate in fig. 8(a-g) comprising a Cu/Ni/Au. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the Cu/Ni/Au conductive line teaching of Sugihara with Okabe's conductive line, because it



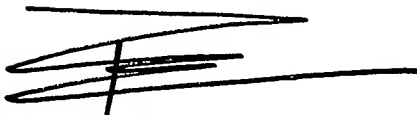
would have prevented reflection from the terminal of the electrical transmission line as taught by Sugihara, see abstract.

**Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thao X. Le  
Patent Examiner  
01 June 2005